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White Paper

Wireless Collaboration with HDBaseT™

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Whether it's in businesses or schools, the demand for easy-access content sharing continues to grow. With increasing acceptance of wireless collaboration, bring-your-own-device (BYOD) policies are becoming a standard practice in today's classrooms and conference rooms.

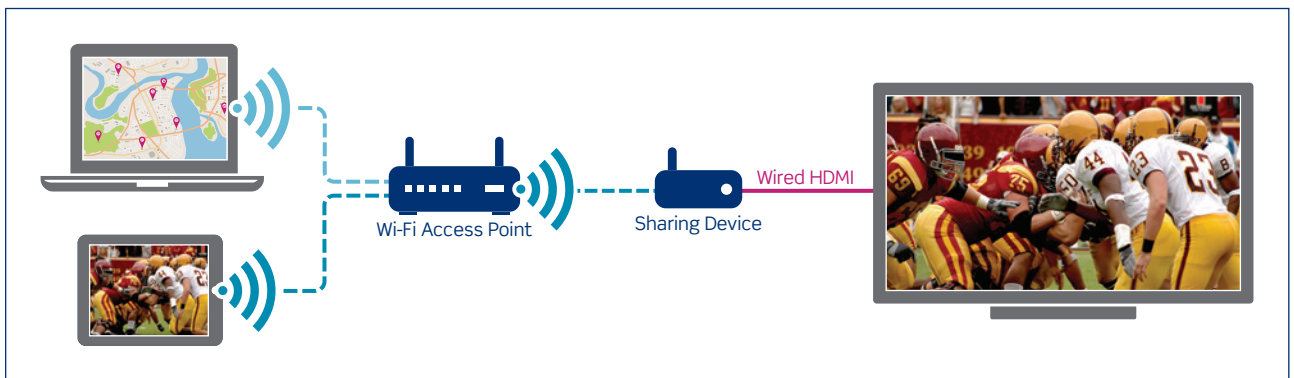
A recent Tech Pro Research study shows that BYOD policies are used in 59% of organizations, with another 13% planning to implement BYOD policies within the next year. These organizations are incorporating wireless collaboration technologies that allow users to quickly and easily connect their smartphone, tablet, or laptop to a display and share content.

A number of popular devices already exist that enable easy wireless collaboration. Google Chromecast, Amazon Fire TV, Apple TV, and Barco ClickShare are among the most recognizable. With the way these systems are advertised, one might assume that wireless sharing is an instant-on solution for video collaboration. Consumers often view wireless devices as replacing the AV network all together, but it's not that simple. There are a number of challenges that need to be considered before deploying these types of sharing devices.

Wireless Collaboration Challenges

To share a video or presentation from your personal device to a room display or projector, access to a common Wi-Fi network is required. It's not as simple as using your hand-held device with a wireless sharing device. As shown in **Figure 1**, the signal transmitted from your device is received by the wireless access point (WAP), sent to the sharing device, and then converted into video output on a display or projector via a wired HDMI® connection. At home this is not an issue, as all of your equipment likely shares the same Wi-Fi network. However, at school or work, network security concerns can prohibit seamless wireless sharing.

Figure 1 — Basic wireless collaboration with open access



Setup for wireless collaboration devices is often straightforward, inexpensive, and easy to complete. However, the device must have open, uncontrolled access to the Wi-Fi network. Most commercial Wi-Fi networks are protected to limit access. Connecting visitors to Wi-Fi can be a security risk, and it takes time and effort to organize.

Some concern exists that wireless sharing allows for too much open or uncontrolled access, since anyone can connect and display any content from their device. This is especially important in workplace and classroom environments, where it's ideal to control who can share wireless content.

Wireless sharing solutions like ClickShare and NovoPro are similar to Apple TV or Chrome devices in that they require either a USB device and/or a specific app loaded to each user device to operate. They are easy to use once all components are set up, but require IT support and maintenance resources or software- and hardware-based solutions to control, monitor, and interact with wireless devices.

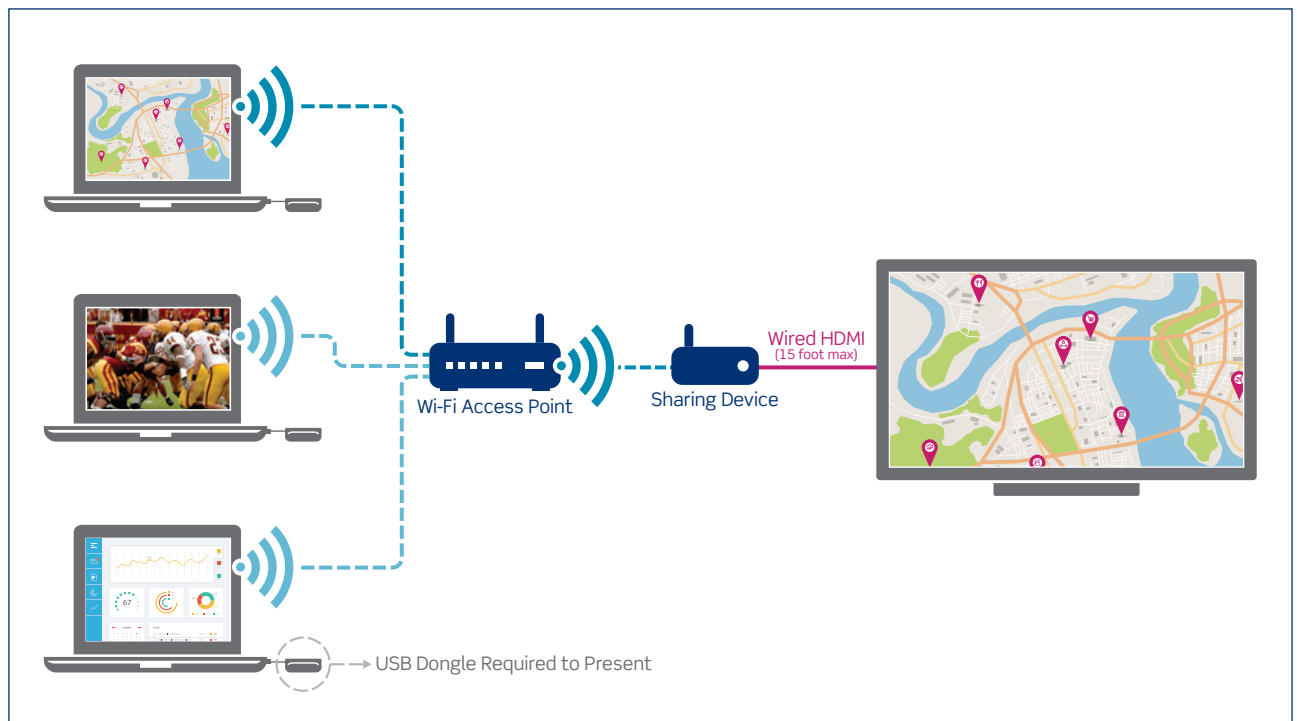
Other more expensive wireless options geared for enterprise environments, such as Mersive Solstice, offer extra collaboration tools, act as Wi-Fi hot spots, and allow meeting moderators to control content on the display. Options like Apple Classroom or Barco's weConnect apps, as well as cloud-based solutions like Cisco Meraki Wireless also provide secure control and monitoring, but come at a significantly higher cost and require dedicated IT support to set up and ensure optimal usability.

Regardless of which solution you choose, these devices do not circumvent the need for structured cabling. Even simple, direct streaming requires two systems working in tandem: a Wi-Fi network and an AV link to the display or projector.

More than Wi-Fi

Having the right network infrastructure is crucial to effectively supporting wireless collaboration in a meeting room or classroom. As previously mentioned, products still rely on a wired HDMI® connection to share content from a wireless sharing device to a display. This passive HDMI connection, shown in **Figure 2**, allows for up to 15 feet of distance between the wireless sharing device and the display. This is impractical in most enterprise applications, especially if any part of the system is ceiling mounted, in an equipment rack, or stashed in a desk or conference room table.

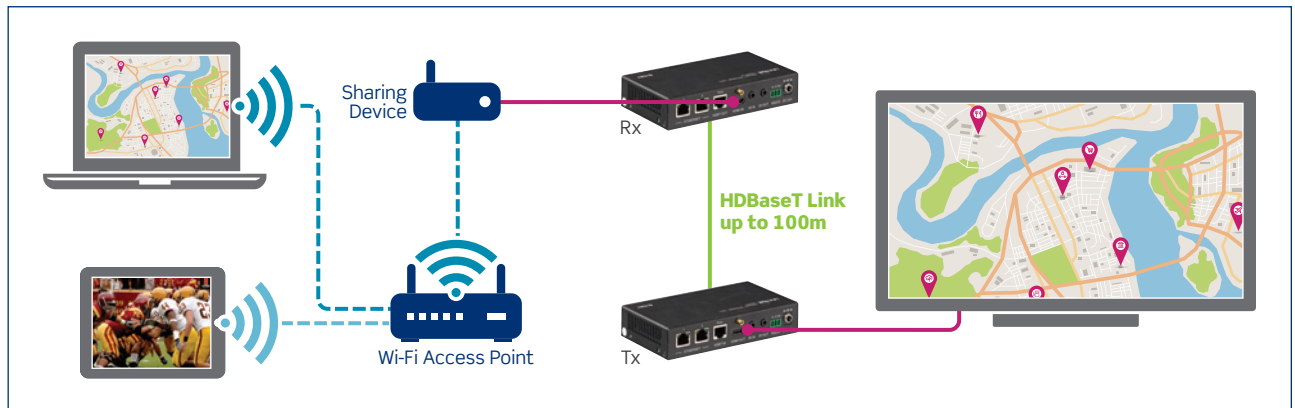
Figure 2 — Basic wireless collaboration with additional access protection



HDBaseT™ IT/AV systems can support any preferred sharing device while extending the signal up to 100 meters (328 feet) over a datacom infrastructure. Once installed, the system supports a sharing solution that is just as easy to use, but is more secure and requires less IT support. As seen in **Figure 3**, the sharing device simply connects to an HDBaseT transmitter extender, and then links to the display from the HDBaseT receiver with an HDMI® cable.

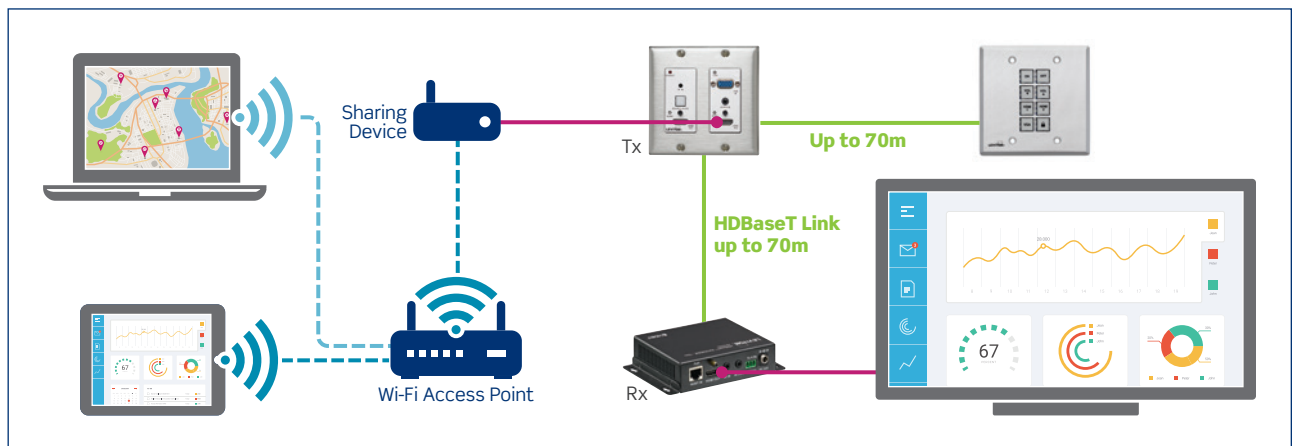
In this setup, the wireless sharing device becomes another source in your AV and data network, like a computer, Blu-Ray player, or set-top box.

Figure 3 — Wireless collaboration with HDBaseT transmitter and receiver



Using HDBaseT™ technology to connect a wireless sharing device as a source in an IT/AV system provides added versatility. Whether you need the sharing device in a location with an optimal Wi-Fi connection, close to other hardware, or secured in a telecom room (TR) or electronics closet, HDBaseT provides greater security and deployment flexibility. And by relying on an HDBaseT link built on a structured cabling backbone, you'll receive the high levels of performance you expect from HD, UHD, or 4K displays and projectors.

Figure 4 — Wireless collaboration with HDBaseT and IT/AV control system



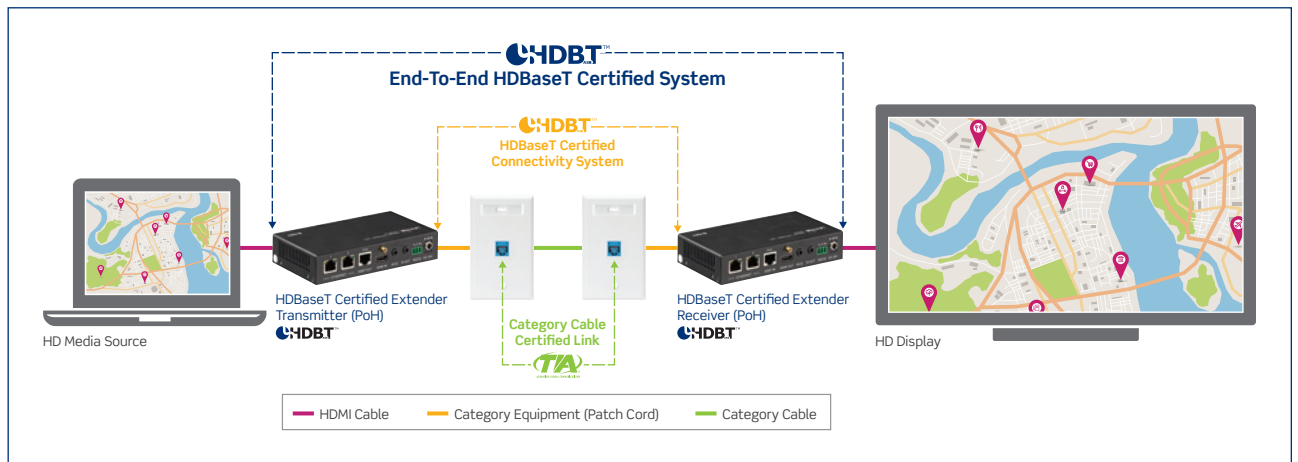
For added system control and flexibility, **Figure 4** shows how to integrate a wireless sharing device with a Leviton IT/AV control system. Using an Autoswitching Wallplate, you can have up to three devices connected to one display in one room. The wireless sharing device plugs into one of the wallplate HDMI inputs. The 8-Button Control Panel helps you easily select which source is displayed, as well as control display volume and power. With this type of system, the infrastructure is more important than the sources. Once an HDBaseT link is installed, you can easily add and update sources as your needs change.

The Simplicity of HDBaseT™

HDBaseT is a technology that enables faster, simpler installations of large-format displays. This is accomplished by using a single category-rated cable to carry the high-bandwidth signals required for high-resolution displays across distances up to 100 meters (328 feet).

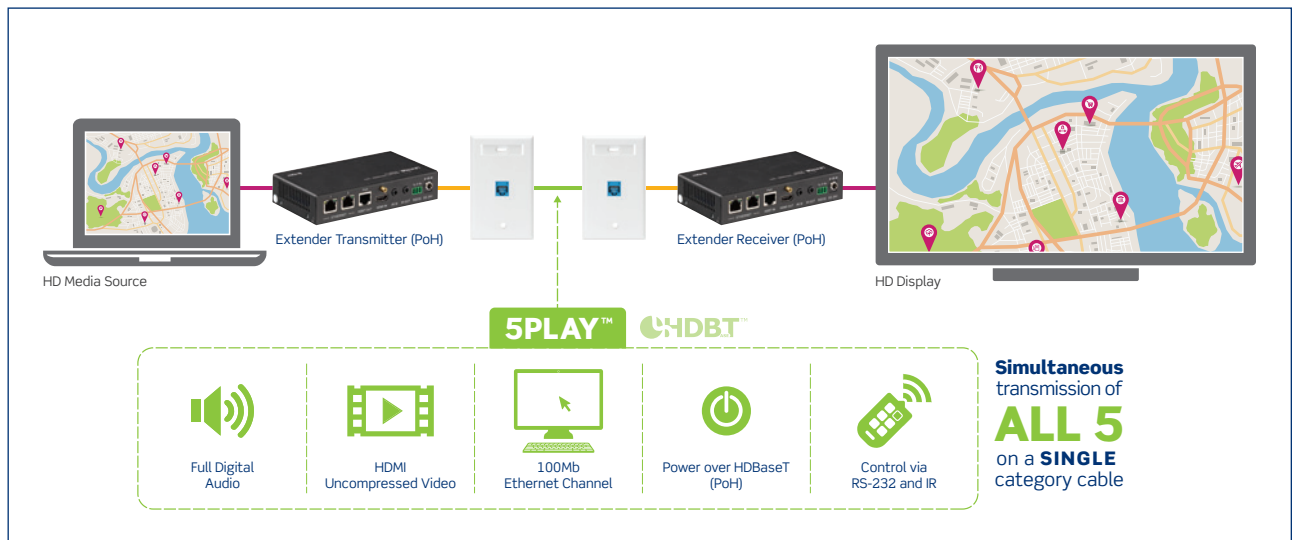
HDBaseT is widely adopted as a reliable, plug-and-play signal extension method. **Figure 5** shows how an HDBaseT AV Signal Extender can turn a tested, certified datacom permanent link into an IT/AV link that is more reliable, flexible, and scalable than traditional passive HDMI® cables.

Figure 5 — Wired HDBaseT IT/AV system



And there is more to HDBaseT than AV extension. As seen in **Figure 6**, HDBaseT supports 5Play™ capability, broadening the variety of protocols transferred over the link. This expands wireless compatibility via RS-232 and IR control, offers a 100Mb Ethernet channel, and supports power over HDBaseT (PoH).

Figure 6 — 5Play capability over HDBaseT

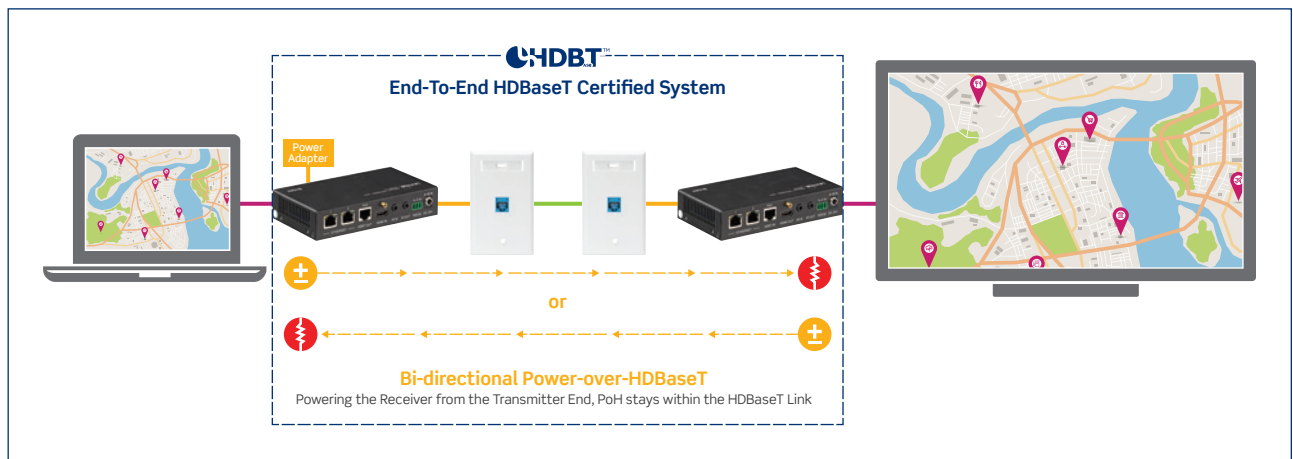


Power Where You Need It

A variation of Power over Ethernet (PoE), PoH enables the safe delivery of up to 100 watts over category-rated cable. While PoH has the capability to deliver up to 100 Watts, today's HDBaseT™ applications typically require less than 10 Watts. For installation flexibility, certified bi-directional PoH transmitters and receivers can be powered at either the source or display end of the link, as shown in **Figure 7**.

Transmitter/receiver pairs draw 10-15 Watts and send half of that power to the other end, typically less than 300mA @ 48 VDC on the four pairs.

Figure 7 — Power over HDBaseT (PoH)



Application and Environment

When selecting components for your HDBaseT system, it's important to know the distance, capabilities, and power required for your application or environment.

HDBaseT 1.0 Class A supports all 5Play™ features (video, audio, Ethernet, power, and control) up to 100 meters (328 feet). By using extenders with Ethernet ports, the system can send internet protocol (IP) to a WAP or smart display. This specification supports 1080p or 4K resolution.

- **1080p** 36-bit deep color at 60Hz and VESA resolutions up to 1920 x 1200 at 60Hz up to 100 meters (328 feet)
- **4K** ultra high definition up to 2160p 24-bit true color at 30Hz with 4K chroma subsampling color palette 4:2:2 up to 60 meters (197 feet)

HDBaseT 1.0 Class B is a cost-effective solution that supports video, audio, power, and control up to a 70-meter distance. It is ideal when Ethernet is not required. This specification supports 1080p or 4K resolution.

- **1080p** 36-bit deep color at 60Hz and VESA resolutions up to 1920 x 1200 at 60Hz up to 70 meters (230 feet)
- **4K** ultra-high definition up to 2160p 24-bit true color at 30Hz with 4K chroma subsampling color palette 4:2:2 up to 40 meters (131 feet)

HDBaseT™ 2.0 introduces three new classes, based on the capabilities of the Valens Colligo chip sets, to transmit ultra-high-definition video, audio, Ethernet, power, control, and USB up to 100 meters (328 feet).

- **Class C** supports USB 2.0 and 4K ultra-high definition up to 2160p 24-bit true color at 60Hz with 4K chroma subsampling color palette 4:2:2 up to 100 meters (328 feet) over Cat 6A cable
- **Class D** is a low-cost solution that supports USB 2.0 and 1080p 36-bit deep color at 60Hz and VESA resolutions up to 1920 x 1200 at 30Hz up to 30 meters (98 feet), making it ideal for classroom applications
- **Class E** supports longer distance transmissions over several kilometers of fiber cabling, but does not feature PoH capability

Wireless Depends on Wired

However you decide to provide sharing capabilities for employees, students, or guests, wireless sharing devices are an attractive solution. To maximize the simplicity and performance of wireless collaboration, it's important to build on a structured cabling foundation. A reliable wired infrastructure, supported by HDBaseT™ signal extension, makes content sharing easy and requires significantly less set up and maintenance at the outset of a meeting or presentation.

To learn more about HDBaseT signal extension and room control solutions, take a look at some of Leviton's other IT/AV white papers at: leviton.com/ns/whitepapers.

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